

A7
24. (Amended) The light string of claim 23, wherein the [maximum] predetermined number of LEDs in [a] the series block is 50.

25. (Amended) The light string of claim 1, wherein the light string further comprises a plurality of series blocks.

A8
28. (Amended) The light string of claim 1 [, wherein a light string further comprises] further comprising a lossy fiber optic rod, having a diameter equal to a diameter of a corresponding LED lens, and a fiber housing, wherein the fiber housing [adaptably] adaptively receives the rod and LED lens into opposing ends, cooperatively, thereby creating an optical icicle feature.

REMARKS

I. Examiner Interview

We note with appreciation the Examiner's courtesy in granting an interview on December 7, 1999 to discuss the distinctions between the claimed invention and all of the cited prior art. We have carefully studied and considered the Examiner's helpful suggestions and have amended claim 1 to more particularly point out and distinctly claim what Applicant believes to be the invention. In amending claim 1, we removed a proposed design equation that the Examiner asserted was conventional, and refocused the claim to the *concept* of driving LED's directly from an AC source without current limiting or power conditioning circuitry. Thus, although the Examiner maintained all the rejections included in the Office Action, and maintained the position that all cited prior art is relevant, we submit that the revised amendment to claim 1 overcomes the prior art of record.

Furthermore, during the Interview, the Examiner repeatedly relied on assertions of "conventional wisdom" to make up for the admitted deficiencies in the prior art. For the reasons explained in greater detail below, Applicant respectfully submits that such assertions have not

been factually demonstrated on the record. In sharp contrast, we submit herewith factual proof that "conventional wisdom" actually teaches away from the Applicant's claimed invention.

II. Claim Status

Claims 1-9 and 11-28 are now pending in the application. Claim 1 is the only independent claim. Claims 2 through 28 depend from claim 1 either directly or via another dependent claim. Claim 10 has been canceled. Claim 1, 3, 9, 14, 19, 20, 22, 24, 25 and 28 have been amended. Claims 3, 9, 14, 22, 24 and 25 have been amended to improve the form of the claims. Claims 19 and 20 have been amended to more adequately and succinctly claim the invention and to improve the form of the claim. Claim 28 has been amended to address an informality as helpfully suggested by the Examiner, and for readability. Applicant hereby requests further examination and reconsideration of the application, in view of the foregoing amendments and arguments.

III. Rejection of the Drawings

The drawings filed June 24, 1999 have been rejected by Notice of Draftperson's Patent Drawing Review. Submission of formal drawings will be made in response to an indication of allowable subject matter.

IV. Objection to Claim 28

The Examiner has objected to claim 28 as containing an undefined word. The Examiner helpfully points out that the word "adaptably" at line 3 of the claim should be changed to -adaptively-. Claim 28 has been amended to overcome the objection in conformance with the Examiner's suggestion. Accordingly, Applicant requests withdrawal of the objection.

V. 35 U.S.C. 103(a) Rejections

Claims 1-12, 14-18 and 21-25 were rejected under 35 USC 103(a) as being obvious over the prior art described in Figure 3 of Reymond (U.S. 5,936, 599) in view of Tong (U.S. 4,223,248). Claims 19, 20, 26 and 27 were rejected under 35 U.S.C. 103(a) as being obvious over the prior art taught in Reymond's reference further in view of Tong and Chang (U.S.

5,887,967). Claims 13 and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art in Reymond's reference in view of Tong and Yam (U.S. 5,762,419). Withdrawal of these rejections are requested for the following reasons.

A. Applicable Law

The conclusion that patent claims are obvious involves a preliminary determination of four factors: (1) the scope and content of the prior art; (2) the differences between the claims and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence, if any, of nonobviousness. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050, 5 U.S.P.Q.2d 1434, 1438 (Fed.Cir. 1988), *cert. denied*, 488 U.S. 825 (1988). Each claim must be considered as a whole when weighing whether the subject matter defined by the claim would have been obvious at the time of its invention to a person of ordinary skill in the art. *In re Wright*, 848 F.2d 1216, 1219, 6 U.S.P.Q.2d 1959, 1961 (Fed.Cir. 1988).

It is the burden of the Patent Office to establish a prima facie case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q.2d 1596, 1598 (Fed.Cir. 1988); *Ex parte Levengood*, 28 U.S.P.Q.2d at 1301. Where, as here, references are hypothetically combined to form the basis of an obviousness rejection, it is the burden of the Patent Office to show that there is some teaching, suggestion, incentive or inference in the prior art that would lead a person of ordinary skill in the art to combine the relevant teachings of the art to arrive at the claimed invention. *Ex parte Levengood*, 28 U.S.P.Q.2d 1300, 1301 (Bd.Pat.App. 1993).

B. Rejection of Claims 1-12, 14-18 and 21-25

Claims 1-12, 14-18 and 21-25 were rejected under 35 USC 103(a) as being obvious over the prior art described in Figure 3 of Reymond in view of Tong. In particular, claims 1-4, 6, 21, 23 and 25 were rejected in view of the prior art shown in Figure 3 of Reymond in combination with Figure 2B of Tong.

1. APPLICANT'S INVENTION

Applicant's invention relates to an LED light string having a pair of wires connected to a standard AC electrical plug. A predetermined number of LEDs are electrically coupled in series to form a series block. The series block is electrically coupled directly to an AC source, without intermediate LED drive circuitry or power conditioning circuitry. Additional series blocks may be coupled to the light string in parallel with the series block.

An object of the invention is to eliminate unnecessary heat dissipation which is a known safety hazard for decorative light strings. The invention accomplishes this objective by eliminating the need for additional power conditioning circuitry, which is the primary source of heat in known LED light array systems. Power conditioning circuitry is also undesirable because it would add to the manufacturing cost and detract from the commercial value of the invention.

2. BRIEF STATEMENT OF EXAMINER'S POSITION AND APPLICANT'S RESPONSE

We note with appreciation the Examiner's frank acknowledgment that the prior art depicted in Figure 3 of Reymond shows various features of the claimed invention except for "each series block being electrically coupled in parallel between each of a pair of wires having a source end and a terminal end, intermediate the source end and the terminal end." To make up for this acknowledged deficiency in the prior art, the rejection references Fig. 2B of Tong which relates to a string of *incandescent* bulbs. Furthermore, during the Interview, to refute Applicant's arguments over Reymond and Tong, the Examiner repeatedly alluded to unsupported assertions of conventional wisdom as a further basis for the rejection.

We respectfully submit that there is no teaching, suggestion, incentive or inference in the prior art that would lead a person of ordinary skill in the art to combine the relevant teachings of Reymond and Tong, if any, to arrive at the claimed invention. Furthermore, in response to the unsupported assertion of conventional wisdom, we note *with support* that conventional wisdom teaches away from Applicant's invention.

3. ARGUMENT

a. There is No Teaching, Suggestion, Incentive or Inference to Combine the Prior Art in Reymond with Tong to Arrive at Applicant's Invention.

Applicant respectfully submits that reliance on the prior art disclosed in Reymond in view of Tong is not applicable and, in particular, is no longer applicable in view of the amendments made to independent claim 1.

The invention relates to a light string having, *inter alia*, a first LED directly coupled to the source end and the terminal end of a first wire and a last LED directly coupled to the source end and the terminal end of a second wire. Claim 1, as amended, specifically recites

... a predetermined number of light emitting diodes "LEDs" electrically coupled in series to form at least one series block, the series block having a first LED and a last LED, *the first LED directly coupled intermediate a source end and a terminal end of a first of a pair of wires and the last LED directly coupled intermediate the source end and terminal end of a second of the pair of wires* . . .

The rejection contends that Claim 1, as originally submitted, would have been obvious over Fig. 3 of Reymond in view of Tong. However, Applicant's invention is distinguished from Fig. 3 of Reymond in that Reymond does not teach or suggest *direct* coupling of the LED's to an AC source without current limiting or power conditioning circuitry. In fact, Reymond teaches to the contrary.

Fig. 3 of Reymond relates to Okuno (U.S. 4,298,869) which shows an LED circuit for traffic signals. A pair of LED arrays, polarized in opposite directions, are connected through a resistor 28 to an AC source. The LEDs within each array are connected in series. Both arrays are connected in parallel with each other such that only one of the arrays is illuminated during each half-cycle of AC power. At col. 2, ll. 50-52; the Reymond disclosure states that "[a]ccording to Okuno, a current limiting resistor 28 (a generating resistor) *must be* connected in series with the arrays," and at line 57 that "the resistor is the *dominant* factor in determining the LED current." To the contrary, Applicant's invention does not include a "generating" resistor, which is required to drive the circuit disclosed in Fig. 3 of Reymond. Applicant's invention *eliminates* external power condition filters, such as the generating resistor, and provides a *direct* electrical connection of the LED string to an AC source. Thus, Fig. 3 of Reymond clearly teaches away from Applicant's invention.

Additionally, the resistor shown in Fig. 3 of Reymond absorbs electrical power and dissipates the energy as heat. Applying this teaching to a decorative light string has significant drawbacks such as posing a serious safety hazard and increasing cost. As such, assuming *arguendo* that Reymond is relevant, the invention solves a problem of the prior art by eliminating a hazardous element that was previously thought to be required in LED light array systems while providing the additional benefit of reducing cost.

Fig. 2B of Tong shows a string of *incandescent* bulbs connected in series with each other, the string connected in parallel between conductors 54 and 55 to recessed terminals 28 and 29, respectively. It is well known in the art that incandescent bulbs and LEDs have significantly different electrical and physical properties, especially in terms of choice of operating voltage and electrical polarity. Hence, there is no motivation to modify a string of *incandescent* bulbs to include or substitute LEDs. Thus, it would not be obvious for one of ordinary skill in the art to use the teachings in the art of incandescent lighting and apply those teachings to a light string using LEDs. Accordingly, Applicant's invention is patentable over the prior art of Reymond in view of Tong and the combination of the references could not be construed to teach or suggest Applicant's invention.

b. Conventional Wisdom Teaches Away from Applicant's Invention and Provides Affirmative Evidence of Non-Obviousness

Applicant's attorney presented the above-reasoning during the Interview. The Examiner acknowledged the quoted language in Reymond, namely that the resistor "must be connected" in the circuit. However, the Examiner contended that it would have been "conventional" to remove the resistor. We appreciate the Examiner's concern, however, we note with respect that the Examiner did not cite a reference showing that removing the resistor would be conventional in the field of decorative light strings. Furthermore, although the Examiner stated during the interview that the resistor is added "only for safety reasons", and that the circuit would work *without* the resistor, the Examiner has not offered any reference or provided any facts on this record to support such a statement. Thus, Applicant respectfully submits that the Examiner has failed to meet her burden of making a *prima facie* case of obviousness.

Should the Examiner choose to maintain this rejection, Applicant respectfully requests that the Examiner provide a reference or an affidavit showing that it is known to couple an LED light string directly to an AC source without any intervening circuitry, such as current limiting or power conditioning circuitry. Moreover, assuming *arguendo* that direct coupling of an LED light string to an AC source is conventional, Applicant requests that the Examiner provide a motivation as to why it would have been obvious to modify the teaching of Reymond to include direct coupling of an LED to an AC source.

To clarify what is taught in the art, and as an affirmative rebuttal to any references that might be placed on the record, we invite the Examiner to the following papers and texts which support the requirement of a resistor or equivalent current limiting circuitry as taught in Reymond:

- Ref.1: Hewlett Packard, Application Note 1005, Operational Considerations for LED Lamps and Display Devices, at page 3 (1998);
- Ref. 2: Klaus Gillessen, Light Emitting Diodes -- An Introduction, at pages 210-11 (Prentice Hall 1987);
- Ref.3: E.W. Williams and R. Hall, Luminescence and the Light Emitting Diode, at pages 215-216 (Pergamon Press 1978);
- Ref. 4: Hewlett-Packard Optoelectronics Division, Optoelectronics Applications Manual, at pages 219 (McGraw-Hill 1977); and
- Ref. 5: A.A. Bergh and P.J. Dean, Light-Emitting Diodes, at pages 544 and 545 and Fig. 7.14 (Clarendon Press 1976).

The pertinent portions of these references are included in the Information Disclosure Statement filed concurrently herewith.

The following quotes from the above-mentioned references set forth the teachings of conventional wisdom, which are in stark contrast to Applicant's invention:

At Page 3 of Ref. 1, Hewlett Packard's Operational Considerations for LED Lamps and Display Devices, current limiting is taught to be required:

Current Limiting

An LED is a current operated device, and therefore, *requires* some kind of current limiting incorporated into the drive circuit. This current limiting typically takes the

form of a current limiter resistor, R, placed in series with the LED. [emphasis supplied]

At pages 210 and 211 of Ref. 2, Light Emitting Diodes--An Introduction, current limiting is again taught to be required:

7-2 Driving of LEDs

7-2-1 Current limiting

... if an LED is driven by a voltage source, its brightness is very sensitive to small voltage fluctuations, due to the steep I-V characteristics. Therefore, some means for current limitation *has to be* provided.

Pages 215 and 216 of Ref. 3, Luminescence and the Light Emitting Diode, explain that some form of series resistance is required to limit current:

10.2 INDICATOR LAMP

... the electrical characteristic of most LED indicator lamps is normally just that of the rectifying junction, i.e. they *need* a series resistance to limit the current.

Pages 2.18 and 2.19 of Ref. 4, Hewlett Packard's Optoelectronics Manual, show that one of ordinary skill in the art would think that Applicant's invention was *not* obvious since removal of current limiting circuitry is taught to harm the LED lamp:

2.4.3 Driving an LED Lamp

2.4.3.1 LED Electrical Characteristics

... Above the breakdown voltage, BV_R , reverse current increases very rapidly, such as shown in Figure 2.4.3.1-1. Exceeding the BV_R will not harm the LED lamp as long as the reverse current is externally limited to prevent excessive power dissipation in the LED. ... When LED lamps are driven from a regulated power supply, a resistor can be used to limit the current flowing through the LED.

Ref. 5, Light Emitting Diodes, teaches at page 544 that “LEDs *must be* biased from a constant current source. In the case of a constant voltage source, this can be approximated by placing a resistor in series with the power supply, as shown in Fig. 7-14.”

To summarize, any reliance on conventional wisdom would support a finding of non-obviousness of the Applicant’s invention. After thorough search and careful study of the art, Applicant, although not his burden, has failed to identify a single source that teaches that it would be conventional to *remove* current limiting circuitry from a string of LED lamps and connect a string of LEDs *directly* to an AC source. To the contrary, all the references on this record teach that current limiting is required, which is consistent with the teachings of Reymond. Thus, Applicant respectfully requests that the Examiner provide proof to the contrary, or withdraw the §103 rejections.

c. Neither Reymond Nor Tong Are Within the Appropriate Scope of the Art

To determine whether a reference is within the appropriate scope of the art it is necessary to determine:

(1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor was involved. *In re Clay*, 23 U.S.P.Q. 2d 1058, 1060 (Fed. Cir. 1992), *citing*, *In re Deminski*, 796 F.2d 436, 442, 230 U.S.P.Q. 313, 315 (Fed Cir. 1986) and *In re Wood*, 599 F.2d 1032, 1036, 202 U.S.P.Q. 171, 174 (CCPA 1979).

First, the prior art disclosed in the Reymond reference is in a totally and radically different field of the inventor’s endeavor because it relates to traffic signaling applications, whereas Applicant’s invention relates to decorative lighting strings. There is simply no relationship between the two.

Second, even if Reymond was in the same field of the inventor’s endeavor, the Reymond reference is not even remotely pertinent to the particular problems that faced the inventor. The Court in *Clay* enumerated on this determination by stating:

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in the considering his problem. Thus, the purposes of both the invention and the prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve. If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that the fact supports use of that reference in an obviousness rejection. An inventor may well have been motivated to consider the reference when making his invention. If it is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it. 23 U.S.P.Q. 2d at 1061.

Reymond is clearly directed to a different purpose. Applicant's invention concerns safety, efficiency over incandescent decorative lighting, reduction in cost, ease-of-use, increased reliability, and increased brightness. The prior art in Reymond is not pertinent to each of these concerns.

For example, eliminating heat-generating power conditioning circuitry in a decorative lighting string reduces the chance of fire, which may result if the heat source comes in contact with flammable material, such as a tree or household linens. The prior art in Reymond does not address this concern. The advantage gained by the prior art in Reymond is simply to use an LED array for traffic signal applications, and power conditioning circuitry is recited as a necessity. Applicant's desire for a safer design that eliminates heat-generating power condition circuitry addresses a problem that the prior art in Reymond did not contemplate. Moreover, the elimination of power conditioning circuitry has a commercial advantage of drastically decreasing the cost of the light string which also was not contemplated by Reymond. Thus, the prior art disclosed in Reymond is not reasonably pertinent to the particular problem in which the Applicant was involved in solving.

4. CONCLUSION

Based on the foregoing, Applicant submits that the light string of amended claim 1 is not taught nor fairly suggested by Fig. 3 of the Reymond reference, the Tong reference, or any of the other references cited. Therefore, reconsideration and withdrawal of the §103 rejection of claim 1

is respectfully requested, and allowance of this claim is solicited. Claims 2-9 and 11-28 all depend from claim 1 either directly or via another dependent claim, and are believed to be allowable for the reasons given in connection therewith.

In addition, Applicant agrees with the Examiner and acknowledges that the structure recited in claims 7-12, 14-18, 22 and 24 is not disclosed, taught or suggested in the prior art of Reymond in view of Tong. Accordingly, absent proof to the contrary, Applicant respectfully submits that the structures recited in these claims would be anything but obvious to one of ordinary skill in the art, particularly in view of amended claim 1 from which claims 7-12, 14-18, 22 and 24 depend.

C. Rejection of Claim 5

The rejection of claims 2-9 and 11-28 are deemed to be moot in view of amended claim 1 which Applicant submits is now in allowable form. However, assuming *arguendo*, that the references are not considered moot, Applicant submits the following distinctions over the prior art:

Claim 5 recites a limitation on the LED in which “each LED has a p-n junction defining a breakdown voltage above which voltage applied in reverse bias said p-n junction breaks down.” The cited portion of Reymond (col. 5, lines 1-13) relates to an arrangement of oppositely polarized LEDs wherein each set of LEDs of similar polarity will light during one half-cycle of the AC voltage source. The reference makes note of LED faults. However, the reference clearly does not disclose, teach or suggest a p-n junction defining a breakdown voltage. Furthermore, the fact that diode ratings may range from 50V to 1000V does not cure the deficiencies of the cited art. LED voltage *tolerance* ratings are typically within a few volts. It is this feature of LEDs that contributes to the commercial success of Applicant’s invention. Low voltage tolerances allow the predetermined number of LED’s to be selected with precision, to match the AC input voltage. Thus, Reymond at col. 5, lines 1-13, in view of Tong, does not teach or suggest the structure recited in claim 5.

D. Rejection of Claims 19, 20, 26 and 27

Claims 19, 20, 26 and 27 were rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over the prior art taught in Reymond’s reference further in view of Tong and Chang

(U.S. 5, 887,967). Applicant reasserts the arguments set forth above and further addresses the rejections to claims 19 and 20 in view of Chang as follows.

Page 6 of the Office Action recites that “it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a socket taught by Chang in to the lighting system of Tong and the prior art mentioned in the Reymond reference.” Page 5 further recites that marks 31, 41 and 21 shown in Chang *inherently* indicate the polarity of the LED.

However, we note that the socket taught by Chang is drastically different from that of Applicant’s invention and Applicant’s invention is an improvement over the light bulb assembly disclosed in Chang. Claim 19, as amended, recites a lamp holder having a keyed offset and a lamp base having a notch adapted to receive the keyed offset of the lamp holder. The keyed offset and notch *mechanically* orient and align the LED by its polarity and prevent improper insertion of the lamp holder into the lamp base. The asymmetrical mechanical design of Applicant’s invention structurally prohibits improper insertion of the LED. Chang discloses a light bulb assembly wherein the base and light bulb holder are each provided with a dint for *visual alignment* of the bulb holder into the base. Unlike Applicant’s invention, Chang’s design does not provide a structure to prevent improper insertion of the LED. According to Chang’s design, human error can result in improper insertion of the LED. Nothing in the brief disclosure of Chang discloses, teaches or suggests a mechanical interlock for fail-proof connection of an LED to a power source to insure proper polarity.

We note with appreciation the Examiner’s willingness to reconsider the rejection of claims 19 and 20 in view of the above argument during the Examiner’s Interview. Thus, Applicant respectfully submits that claim 19, as amended, is in allowable form. Claim 20, as amended, depends from claim 19 and is also believed to be in allowable form. Reconsideration and withdrawal of the §103 rejections of claims 19, 20, 26 and 27 is therefore respectfully requested, and allowance of these claims is earnestly solicited.

E. Rejection of Claims 13 and 28

Claims 13 and 28 were rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art in Reymond's reference in view of Tong and Yam (U.S. 5,762,419). Applicant reasserts the reasoning set forth above and further addresses the rejections to claims 13 and 28 in view of Yam as follows.

Page 6 of the Office Action states that it would have been obvious to utilize the method using fiber optic guide as taught by Yam in Figure 18 into Tong's light circuit implemented by the prior art in Reymond's reference for transmitting the light from the LED through fiber optic guide.

Claim 13 recites at least one LED comprising a housing and a fiber-optic bundle removeably mounted to the housing operative to diffuse light output of the LED through the fiber-optic bundle. Claim 28 recites a lossy fiber optic rod.

Applicant respectfully submits that the rejection is based on improper hindsight reconstruction in citing the Yam reference. As noted above, to determine whether a reference is within the appropriate scope of the art it is necessary to determine whether the reference is "within the field of the inventor's endeavor" or is "reasonably pertinent to the particular problem with which the inventor was involved." Yam is not "within the field of the inventor's endeavor" because it relates to the calibration of instruments using a stable infrared light source. Furthermore, Yam is not "reasonably pertinent to the particular problem with which the inventor was involved" because, in Yam, a fiber optic bundle is used to transmit *invisible* (infrared) light from a light source to a light emitting surface to transfer data. Yam is concerned with the transfer of *invisible* light with minimal loss between source and emitting surface. To the contrary, Applicant's invention is directed toward the purposeful loss of visible light for aesthetic value. Thus, Yam fails both criteria set forth in *Clay* and is not within the appropriate scope of the art to be cited against Applicant's invention. Thus, it would not have been obvious for one of ordinary skill in the art to look to the teachings of Yam and combine those teachings with Tong and the prior art in Reymond.

Regardless, Yam does not teach, disclose or suggest a removably mounted fiber-optic bundle as recited in claim 13 or a lossy fiber optic rod as recited in claim 28. At column 10, lines

31-33, Yam discloses that “the fiber optic guide 256 is *secured* in the cavity by set screws 267 or some other mechanical or adhesive or connector.” There is no mention of removably mounting a fiber optic-bundle as recited in claim 13. Thus, Yam does not teach or suggest a removably mounted fiber optic bundle.

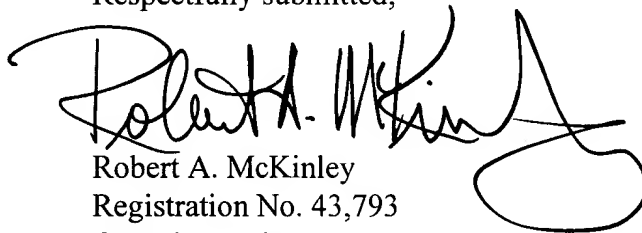
Regarding the rejection of claim 28, the fiber optic guide disclosed in figure 18 of Yam transfers *invisible* light and functions to promote minimal loss between source and emitting surface. The *lossy* fiber optic rod recited in claim 28 is a different structure than the fiber optic guide of Yam. The *lossy* fiber optic rod, by definition, purposefully emits visible light throughout the length of the rod. Thus, assuming *arguendo* that Yam is within the appropriate scope of the art, the *lossy* fiber optic rod of Applicant’s invention could not be construed as an obvious variation of the fiber optic guide and associated structure disclosed in Figure 18 of Yam.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the §103 rejections of claims 13 and 28.

Should the Examiner believe that direct contact with the Applicant's attorney would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the number listed below.

Applicants respectfully submits that the claims as amended are patentable over the cited references. Accordingly, an early Notice of Allowance is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Robert A. McKinley", with a large, stylized flourish extending from the end of the signature.

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